



## 1. ENVIRONMENT MANAGEMENT PLAN

The Environment Management Action Plan (EMP) is required to ensure sustainable development of the proposed Sewerage System in District 'E' of Allahabad, Uttar Pradesh. The project components include:

- Construction of New SPS (Sewage Pumping Station) at Kalimandir;
- Construction of new SPS at Vivekanand Park;
- Laying/Replacement of Trunk Sewers-11km

Most of the subprojects as mentioned above are at construction stage and thus it is necessary that mitigation measures are taken up at the construction stage and operation stage to sustainably implement the project. Project specific EMP is given in table 1.1.

In general, the Uttar Pradesh Jal Nigam (UPJN) (with assistance from Contractor and Independent Engineer/Supervision Consultant) is the responsible entity for ensuring that the mitigation measures as suggested in the EMP are carried out.

### 1.1 Specific activities by UPJN

The role of UPJN in the implementation of EMP involves the following activities:

- EMP clearance from NMCG and World Bank and disclosure as required;
- Integrating the EMP in the contract document of contractor as an addendum;
- Tree plantation around the SPS;

### 1.2 Specific activities by Contractor

The activities to be performed by the contractor to implement the EMP shall comprise the following:

- Tree plantation around the SPS in support with UPJN;
- Implementation of other mitigation measures, as recommended in EMP and DDR

### 1.3 Implementation of EMP

The contractor shall be responsible to implement the EMP primarily in assistance with the Project Management Consultant team. The Environmental Specialist from the Independent Engineer/Supervision Consultant shall monitor the compliance of the EMP and all the design drawings of various civil structures shall be implemented after his approval.

The present project includes construction of new SPS. The implementation team through contractor and supervision consultant shall ensure that:

- Specific site shall be identified for intermittent storage of waste at each SPS and shall be disposed in the designated site;
- Tree plantation shall be made on the periphery of the SPS site to prevent of bad odour and undertake landscaping to enhance aesthetic at each SPS locations;

The organogram for the implementation and monitoring of EMP is presented in figure 1-1. Contractor shall report the implementation of the EMP to the Environmental Expert of Supervision Consultant as well as to UPJN and SPMJ through monthly reports. Further a quarterly report is required to be prepared and required to be given to NMCG for monitoring the progress made in implementing the EMP.

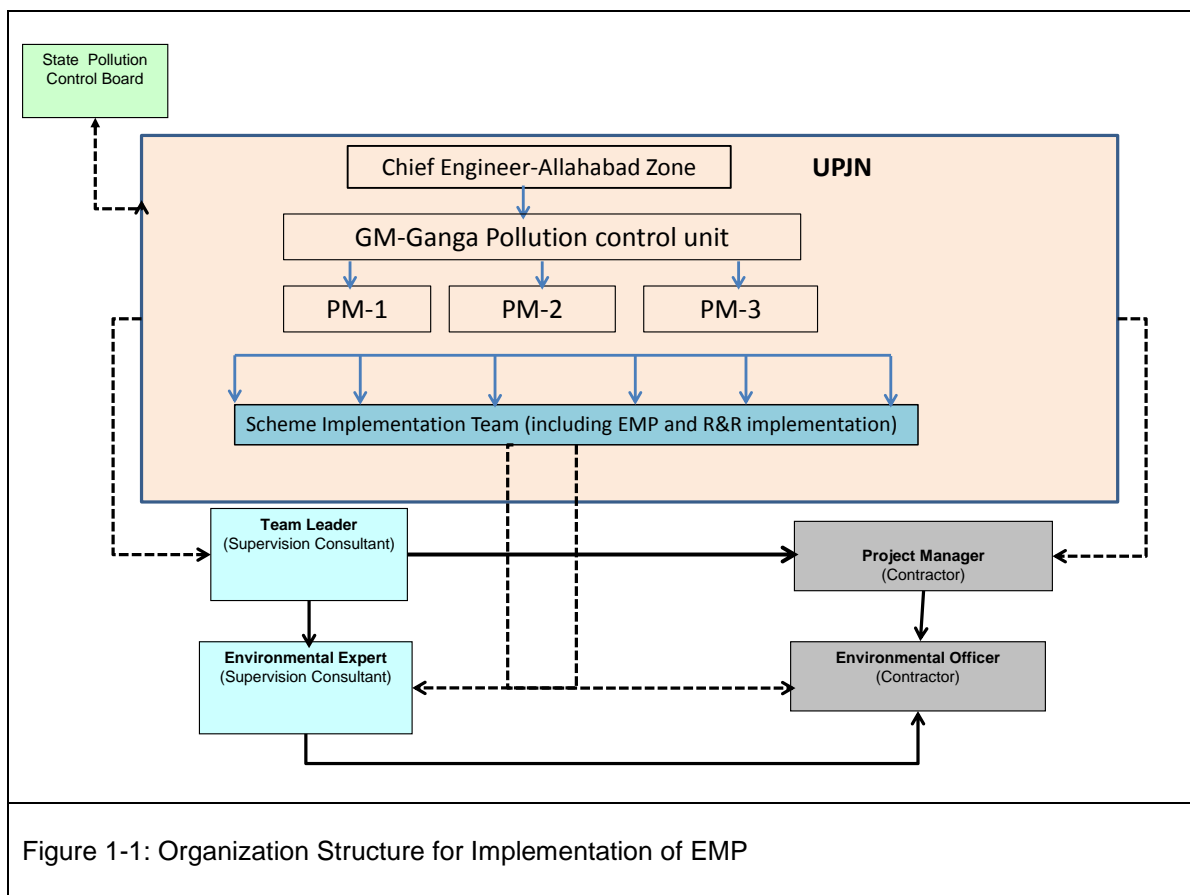


Figure 1-1: Organization Structure for Implementation of EMP

**Table 1-1: Environment Management Plan**

Activity	Potential Negative Impact/Concern	Duration of impact	Mitigation Measures	Responsible agency	
<b>A. Design and Development Phase</b>					
Sewerage Network (Trunk sewer line)	Accidental leakages/ bursts	<ul style="list-style-type: none"> <li>Flooding of nearby areas due to leakage/bursts</li> <li>Backlogging due to unexpected heavy flow rates</li> </ul>	Temporary	<ul style="list-style-type: none"> <li>Designing sewers with adequate capacity and flow velocity</li> <li>Regular inspection and maintenance of the sewer lines.</li> </ul>	UP Jal Nigam Design consultants
Expansion of Sewage Pumping Stations (SPSs)	Pumping of sewage from District E to SPSs proposed under the project	<ul style="list-style-type: none"> <li>Noise and odour nuisance to surrounding areas.</li> </ul>	Permanent	<ul style="list-style-type: none"> <li>Pumping station to ensure minimum noise generation by locating within a noise reducing structure or in an enclosed space (such as concrete/brick structure)</li> <li>Use of less noise generating equipment such as submersible pumps, enclosed generators</li> <li>Regular maintenance and switching off equipment when not in use;</li> <li>Equipment's need to meet the noise standards as prescribed by CPCB<sup>1</sup>.</li> <li>Regular clearance of sludge and solid waste to minimize odor nuisance.</li> <li>Spraying of herbicides like <b>Maple</b> and <b>Gtech</b> on accumulated sludge/solid to reduce odour.</li> </ul>	<ul style="list-style-type: none"> <li>UP Jal Nigam</li> <li>Design consultants</li> <li>Jal Sansthan (for O and M)</li> </ul>
<b>B. Construction phase</b>					

<sup>1</sup> <http://moef.gov.in/citizen/specinfo/noise.html>

Laying/Replacement of trunk sewers	Excavation, cutting, back filling and compaction operations	Generation of substantial debris, top soil and muck during construction of laying/replacement of Trunk Sewers	Temporary	<p>Instead of disposing top soil to low lying areas:</p> <ul style="list-style-type: none"> <li>• Top soil may be used for agricultural purpose or development of city parks.</li> <li>• Soil and debris may be managed for planned land filling and landscaping;</li> <li>• Debris may be suitably stored to filling back the excavated areas after placing the trunk sewer lines.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• Project management consultant</li> <li>• UP Jal Nigam</li> </ul>
		Accidents/ damages due to erosion/ sliding of vertical sides of excavated trenches while places the pipes	Temporary	<ul style="list-style-type: none"> <li>• Maintaining the excavation by shoring trench sides by placing sheeting, timber shores, trench jacks, bracing, piles, etc.</li> <li>• Exposed surface will be resurfaced and stabilized.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• Project management consultant</li> <li>• UP Jal Nigam</li> </ul>
		Dust Generation due to excavation, cutting, back filling and compaction operations	Temporary	<p>The PM<sub>10</sub> in district 'A' is already high , hence:</p> <ul style="list-style-type: none"> <li>• Water sprinkling to be done in the construction and excavation areas;</li> <li>• Additionally, it is recommended to wet and cover excavated material transported by trucks.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• Project management consultant</li> <li>• UP Jal Nigam</li> </ul>
		Noise and vibration disturbances to residents and businesses	Temporary	<ul style="list-style-type: none"> <li>• Construction activities to be done in day time after giving prior intimation to local residents/shop keepers;</li> <li>• Construction near schools and hospitals colleges to be carried out during vacations with prior information;</li> <li>• Use of low noise and low vibrating equipment to be encouraged;</li> <li>• Instruments need to meet standards of CPCB<sup>2</sup>.</li> <li>• Provision of PPE to construction workers; like ear muffs and plugs;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor</li> <li>• Project management consultant</li> <li>• UP Jal Nigam</li> </ul>

<sup>2</sup> <http://moef.gov.in/citizen/specinfo/noise.html>

		Temporary flooding due to excavation during monsoons or blockage of surface drains	Temporary	<ul style="list-style-type: none"> <li>Stockpiled areas to be bordered by berms;</li> <li>Stockpiles to be done in high areas to avoid flow in storm water run-off channels and erosion;</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
		Increased traffic inconvenience (emissions, congestions, longer travel times, blockage of access)	Temporary	<ul style="list-style-type: none"> <li>Alternate traffic routing to be adopted in consultation with traffic police authorities.</li> <li>Construction works at business and market area must be completed earlier to minimize business loss.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> <li>Traffic police</li> </ul>
		Settlement of backfilled area after construction	Temporary	<ul style="list-style-type: none"> <li>The backfilling material shall be free from petroleum products, slag, cinders, ash or other material.</li> <li>Backfilling activity should follow the construction schedule like completing 1 km stretch of within 5 days.</li> <li>Proper compaction as per the soil condition and retain the original level/ alignment.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
		Spillage of fuel and oil	Temporary	<ul style="list-style-type: none"> <li>Care to be taken to store fuel and oil (if required) at a place away from any drainage channel/nalla preferably to be stored in drums mounted on a concrete paved platform.</li> <li>Any spillage of oil is to be checked.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
Sewage pumping stations (SPSs)	Excavation	Damage to topsoil due to excavation activities.	Temporary	The construction of SPS will require to take care that top soils to be stockpiled and may be reused for the preparation of green belt development	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
		Construction waste	Temporary	<ul style="list-style-type: none"> <li>All the associated construction waste should be properly managed by storing and disposing off at identified refusal sites.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>

		Sludge Disposal	Temporary	Instead of disposing digested sludge opting for <i>salting</i> the digested sludge to local farmers or to the authorities for maintaining the land scaping in city level parks to be done.	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> <li>Forest Department</li> </ul>
		Dust Generation due to construction activities	Temporary	<ul style="list-style-type: none"> <li>Excavated material transported by trucks will be covered and/or wetted to prevent dust nuisance.</li> <li>Suppressing dust generation by spraying water on stockpiles</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
		Temporary flooding due to uneven dumping of construction waste	Temporary	<ul style="list-style-type: none"> <li>Waste materials to be stored on the high lying areas and storing near to storm water run-off channels or any low lying areas to be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
General: safety during construction		Safety hazards to labours and public. Workers are seen to working without any PPE even at height.	Temporary	<ul style="list-style-type: none"> <li>Comply with the Occupational health and Safety act of India</li> <li>Workers working at height need to be given proper PPE;</li> <li>Workers near high noise equipment's to be given PPE;</li> <li>Ensure that the contact details of the police or security company and ambulance services nearby to the site.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>Project management consultant</li> <li>UP Jal Nigam</li> </ul>
<b>C. Operation phase</b>					
Sewer line	Leakage/ overflows	Water pollution and possibility of mixing with water supply line	Permanent	<ul style="list-style-type: none"> <li>Regular monitoring of sewer line and manholes for visible leakages/ overflows.</li> <li>Immediate repair operation for the damaged portion of sewer line.</li> <li>De-siltation of blocked sewers/ manholes with sewage pumping machines-storing and</li> </ul>	UPJN and its SPV

				disposal at appropriate refusal area after treatment. <ul style="list-style-type: none"> <li>Ensure proper covering of manhole and avoid dumping of solid waste to prevent chocking of sewer line.</li> </ul>	
Sewage pumping station	Noise pollution from operation activities		Permanent	<ul style="list-style-type: none"> <li>Proper handling and regular maintenance of operating machines including pumps, generators, air diffusers, etc.</li> </ul>	UPJN
	Treatment and Disposal	Problems arising due to bad odour, insects, polluted air, noise pollution, etc.	Permanent	<ul style="list-style-type: none"> <li>Provide buffer zones in the form of green belt around the SPS; to be ensured during the design and construction phase itself.</li> <li>In view of the demand of local community, the remaining areas of the SPS may be developed as a park.</li> </ul>	<ul style="list-style-type: none"> <li>UP Jal Nigam</li> </ul>
		Indiscriminate disposal of sludge leading to contamination of land and soil.	Permanent	<ul style="list-style-type: none"> <li>Prepares a sludge disposal plan and adheres to the same.</li> <li>Ensure proper functioning of STP for digestion of sludge and ensure adequate functioning of dewatering units for efficient functioning of system</li> </ul>	<ul style="list-style-type: none"> <li>UP Jal Nigam</li> </ul>
		Reduced land values in nearby areas and aesthetics affected.	Permanent	<ul style="list-style-type: none"> <li>Adequate buffer zones during development and construction phase should mitigate the affect considerably.</li> </ul>	<ul style="list-style-type: none"> <li>UP Jal Nigam</li> </ul>
General Safety	Workers exposed to toxic gases in sewers and hazardous materials	<ul style="list-style-type: none"> <li>Serious/health/ safety hazards</li> <li>The toxic gases are likely to contract communicable diseases from exposure to pathogens present in the sewage.</li> </ul>	Temporary	<ul style="list-style-type: none"> <li>During cleaning/ maintenance operation, the sewer line will be adequately vented to ensure that no toxic or hazardous gases are present in the line.</li> </ul>	<ul style="list-style-type: none"> <li>UP Jal Nigam</li> </ul>

